

# Fort Bragg



*Home of the Airborne & Special Operations*

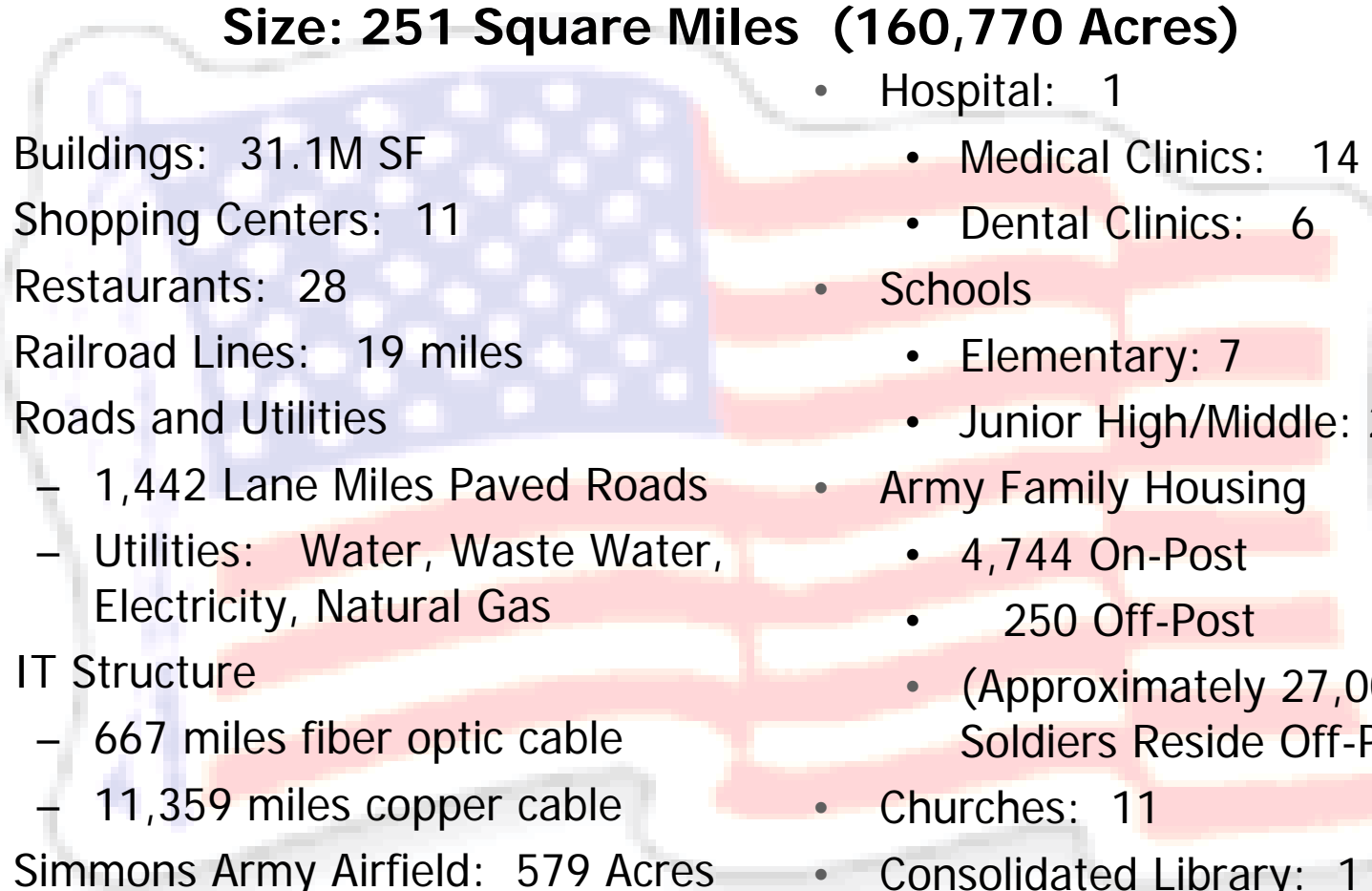


# Energy Brief

*Russell Hayes.  
Mechanical Champion,  
Directorate of Public Works  
Fort Bragg*

# ***FORT BRAGG - “More Than A City”***

**Size: 251 Square Miles (160,770 Acres)**

- 
- Buildings: 31.1M SF
  - Shopping Centers: 11
  - Restaurants: 28
  - Railroad Lines: 19 miles
  - Roads and Utilities
    - 1,442 Lane Miles Paved Roads
    - Utilities: Water, Waste Water, Electricity, Natural Gas
  - IT Structure
    - 667 miles fiber optic cable
    - 11,359 miles copper cable
  - Simmons Army Airfield: 579 Acres
  - Camp Mackall: 7,934 Acres
  - Museums: 3
  - Hospital: 1
  - Medical Clinics: 14
  - Dental Clinics: 6
  - Schools
    - Elementary: 7
    - Junior High/Middle: 2
  - Army Family Housing
    - 4,744 On-Post
    - 250 Off-Post
    - (Approximately 27,000 Soldiers Reside Off-Post)
  - Churches: 11
  - Consolidated Library: 1
  - Child Care Centers: 4
  - Recreational Facilities: 239

**Total Population Supported: 241, 388**

# ***FORT BRAGG POPULATION***

<b>Fort Bragg Demographic Profile</b>	<b>Number</b>
Active Duty Military (Includes Active AR & NG)	52,280
Annual Reserve Components	9,503
Temporary Duty Students	3,121
Mobilized Soldiers Assigned	2,742
Civilian Employees (APF, NAF, Contract)	8,757
Contractors	3,516
Active Duty Family Members	62,962
Retirees & Family Members	98,507
Total Population Supported	241,388

21 Years Of MCA Construction

FY 85	\$	108,100,000
FY 86	\$	65,100,000
FY 87	\$	23,700,000
FY 88	\$	37,000,000
FY 89	\$	36,800,000
FY 90	\$	59,600,000
FY 91	\$	53,000,000
FY 92	\$	65,900,000
FY 93	\$	12,700,000
FY 94	\$	202,775,000
FY 95	\$	135,505,000
FY 96	\$	60,035,000
FY 97	\$	143,687,000
FY 98	\$	58,306,000
FY 99	\$	147,340,000
FY 00	\$	75,724,000
FY 01	\$	159,762,000
FY 02	\$	198,135,000
FY 03	\$	195,860,000
FY 04	\$	148,900,000
FY 05	\$	182,700,000
TOTAL	\$	2,170,629,000

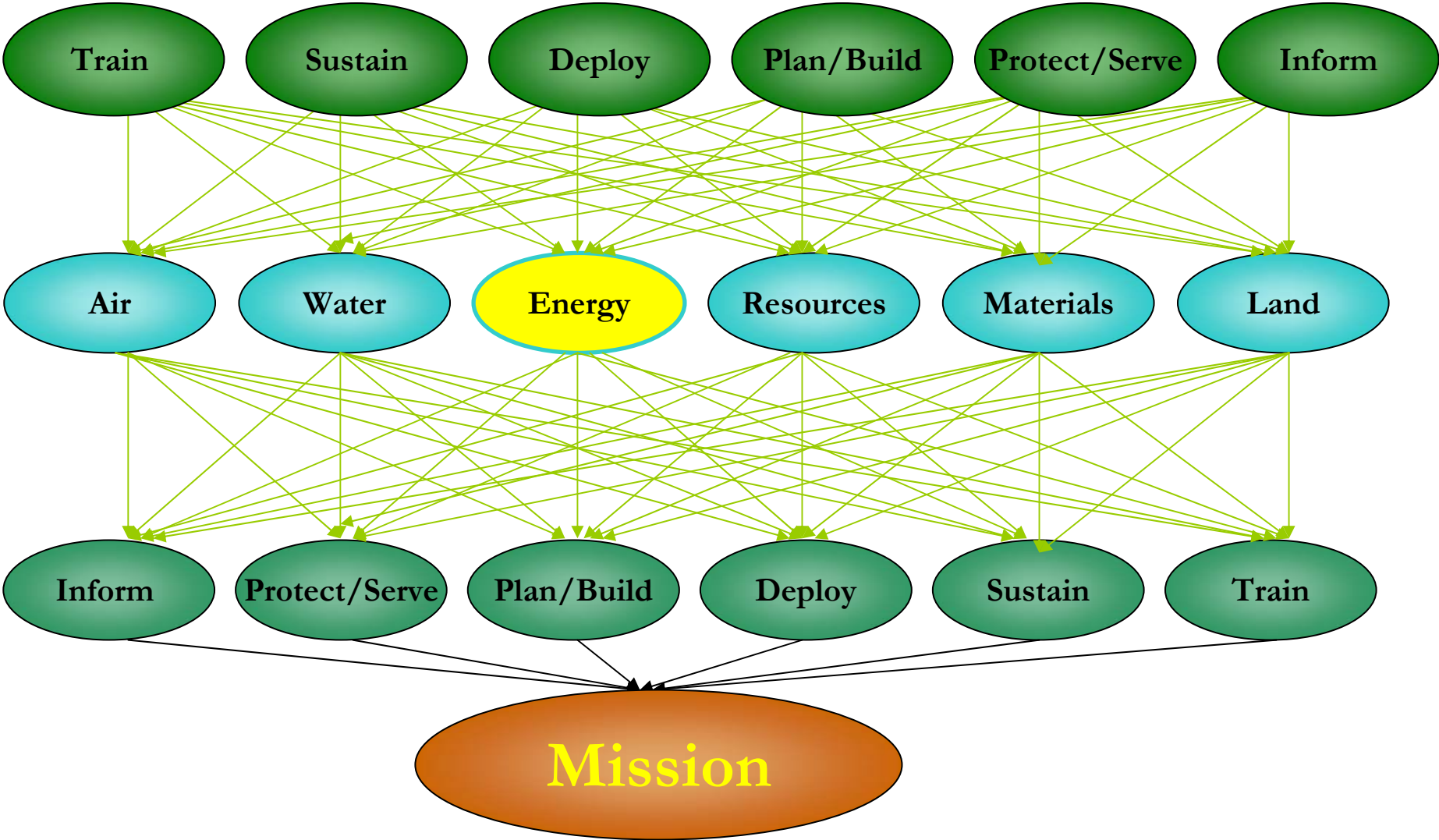
Growth of  
10 Million SF  
In 21 Years

A LOT OF MILITARY  
CONSTRUCTION!!!

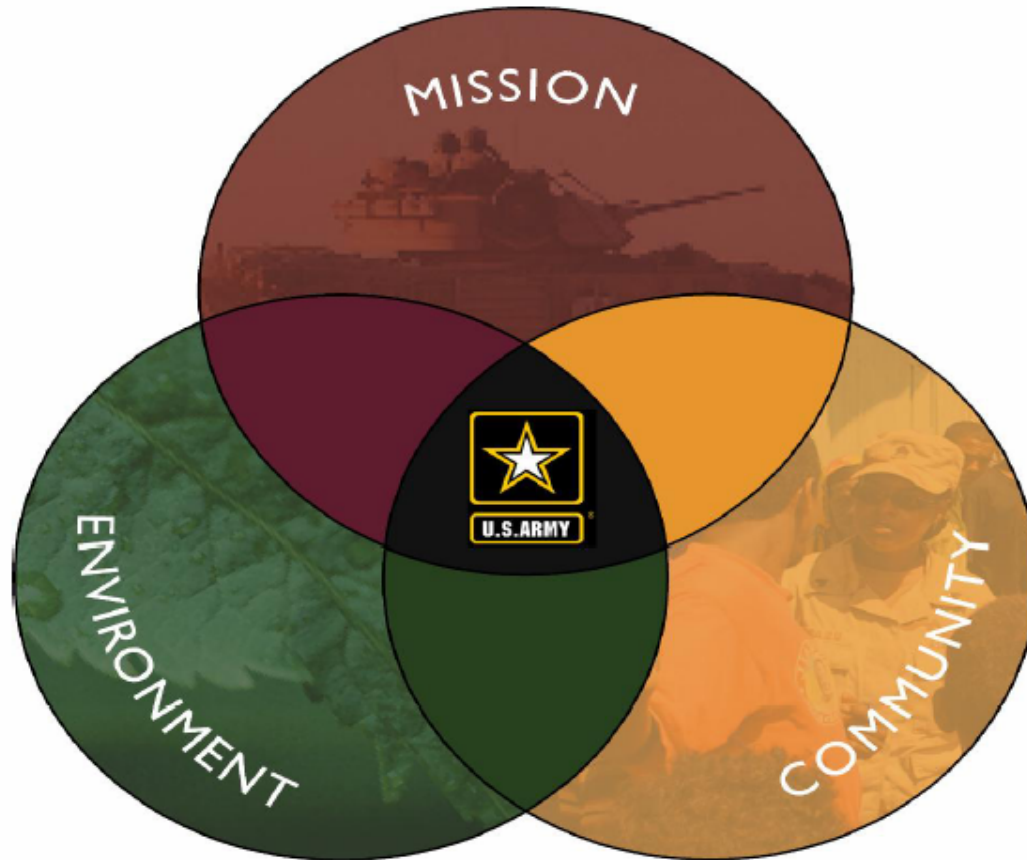
Construction Budget FY06 – FY11  
FYDP + BRAC + Modular Force +  
PMH

FY 06	\$	248,785,000
FY 07	\$	261,123,000
FY 08	\$	480,313,000
FY 09	\$	651,100,000
FY 10	\$	323,580,000
FY 11	\$	146,609,000
PMH	\$	400,000,000
Other Projects	\$	469,000,000
TOTAL	\$	2,980,510,000





# Sustainability is about balance... today and tomorrow



# Ft. Bragg

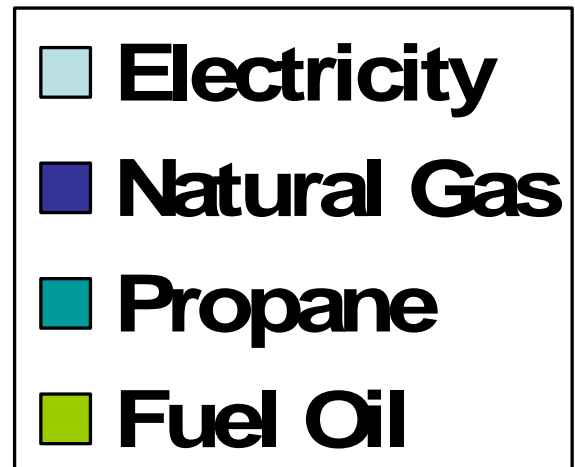
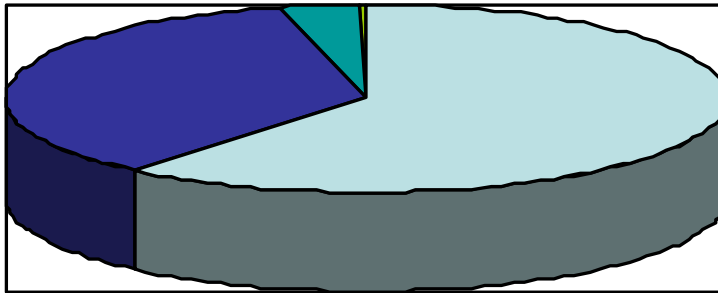
## • Current and Projected Energy Cost and Consumption

Fiscal Year	Power Cost	KWh Consumed	Fuel Cost	Fuel Consumed (Btu)	Total Energy Cost
FY 1997	\$23,778,036	438,340,828	\$7,619,382	1,666,823	31,397,418
FY 1998	\$24,956,335	476,981,425	\$8,220,906	1,647,718	33,177,241
FY 1999	\$24,750,153	490,503,048	\$5,951,363	1,497,173	30,701,516
FY 2000	\$22,716,358	496,206,161	\$5,633,156	1,400,196	28,349,514
FY 2001	\$22,864,574	529,185,789	\$10,292,337	1,439,297	33,156,911
FY 2002	\$23,314,405	519,369,320	\$6,027,701	1,208,192	29,342,106
FY 2003	\$24,086,157	528,474,190	\$8,490,921	1,434,586	32,577,079
FY 2004	\$25,687,080	539,470,144	\$10,022,401	1,480,466	35,709,481
FY2005	\$28,149,514	551,127,636	\$12,918,951	1,597,610	41,068,465
FY 2006	\$30,799,213	560,019,278	\$17,509,982	1,338,429	50,291,064
FY 2007	\$42,499,772	722,785,241	\$13,428,071	1,983,536	55,927,843
FY 2008	\$45,315,492	785,636,132	\$14,595,730	2,156,018	59,911,222
FY 2009	\$49,847,041	864,199,745	\$16,055,303	2,371,619	65,902,344
FY 2010	\$51,357,558	890,387,616	\$16,541,827	2,443,487	67,899,385

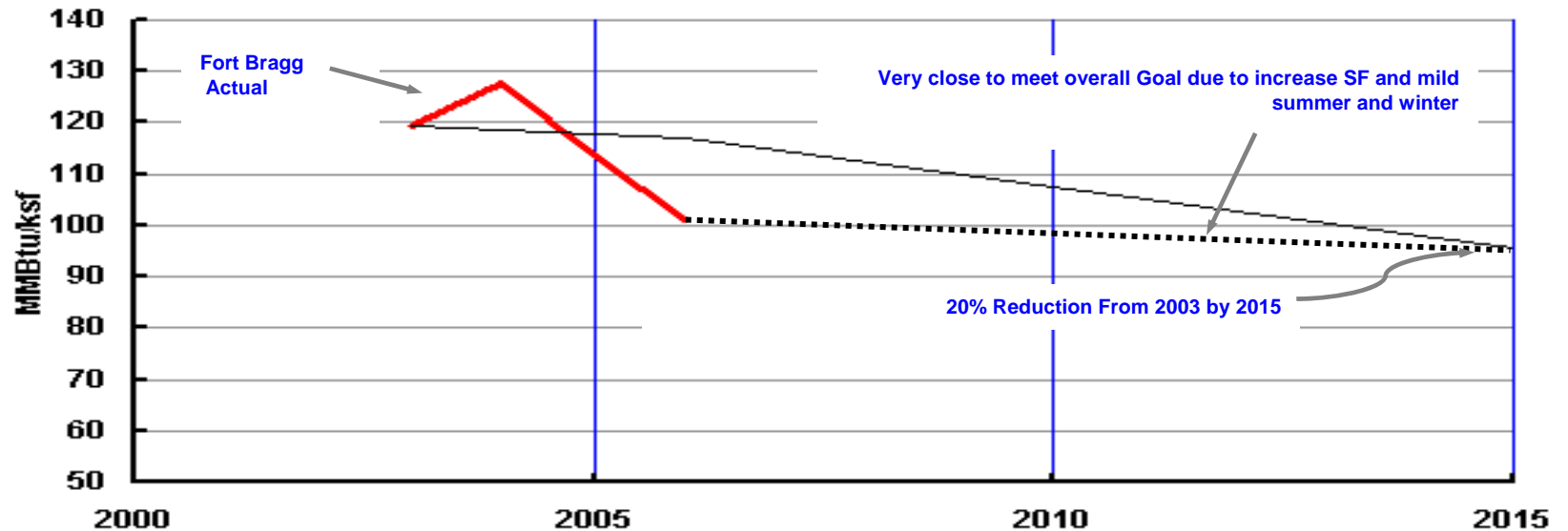


# FY06 Energy Bill

Utility	Consumption MMBTU	Consumption %	Cost	Cost %
Electricity	1911	56.31%	\$30,799,213	61.24%
Natural Gas	1338	39.42%	\$17,509,982	34.82%
Propane	134	3.95%	\$1,796,142	3.57%
Fuel Oil	11	0.32%	\$185,726	0.37%
<b>Total</b>	<b>3394</b>	<b>100%</b>	<b>\$50,291,063</b>	<b>100%</b>



# FY06 Glide Path

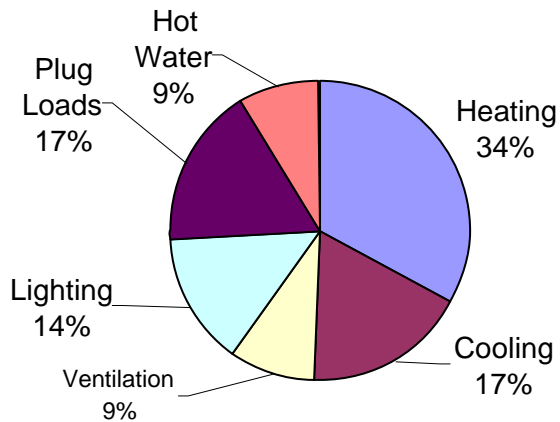


Fort Bragg Energy Reduction Glide Path

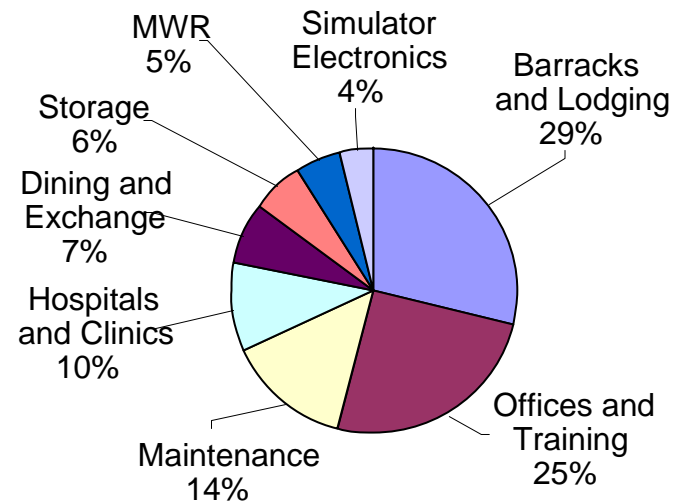
# Ft. Bragg Load Profiles

Where did all the Energy go?

Fort Bragg Energy Use by End-Use

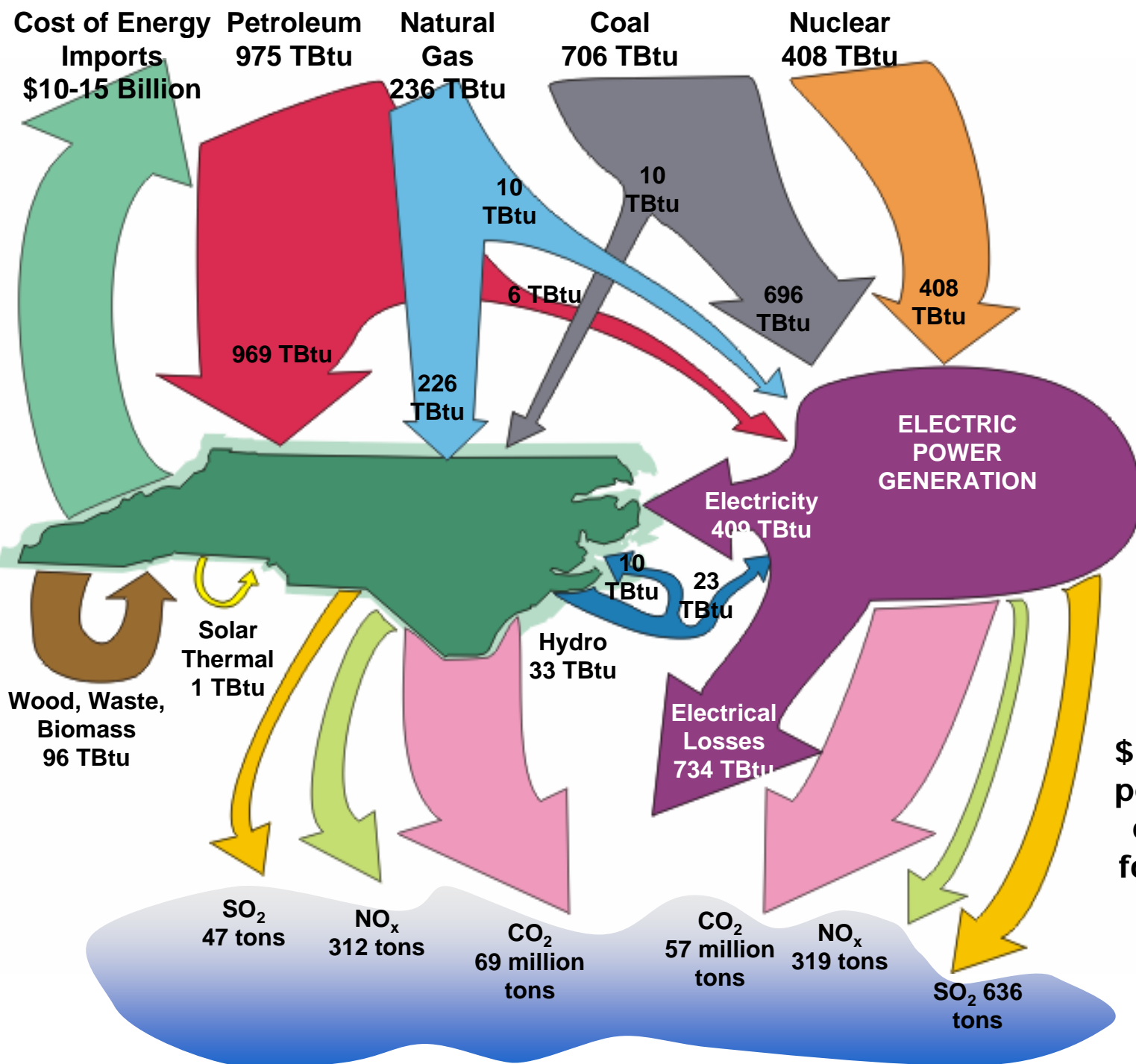


Fort Bragg Energy Use by Building Type



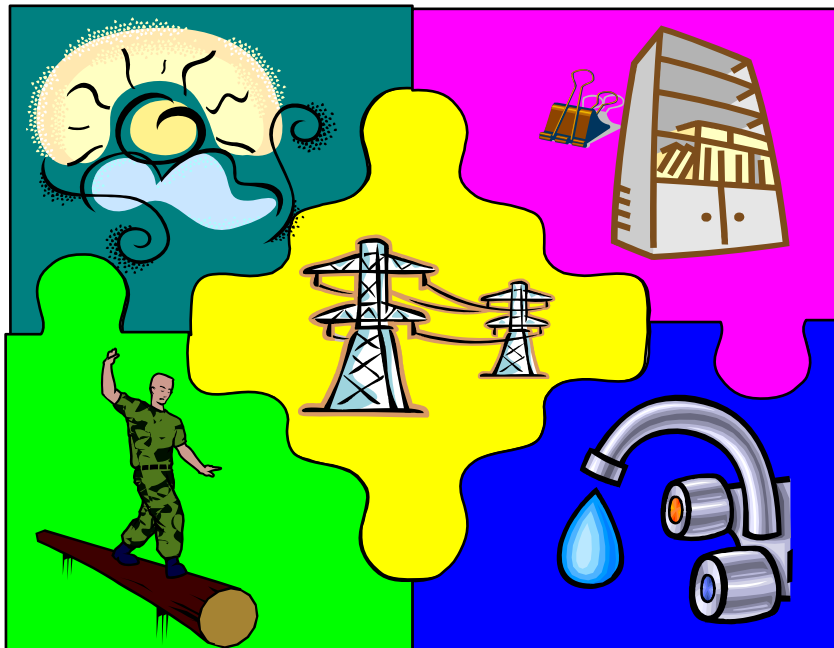
- 60% of Energy Use is for HVAC

# Energy Flows In North Carolina



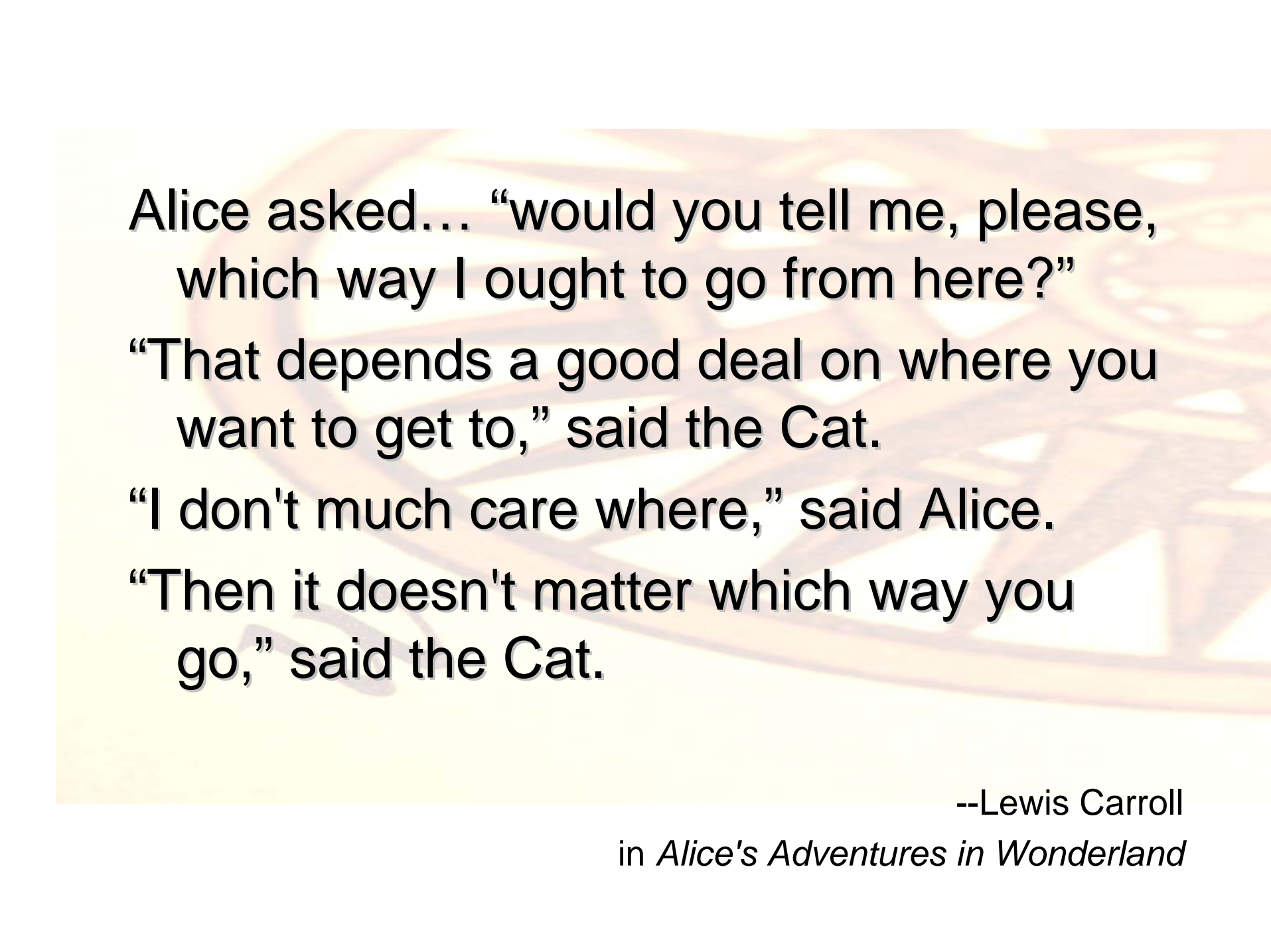
\$10-\$15 billion per year leaves our economy for energy fuel imports

# Sustainable Fort Bragg - Baseline Challenges



- **Energy**
- **Air Quality**
- **Water**
- **Materials**
- **Training Areas**





Alice asked... “would you tell me, please,  
which way I ought to go from here?”

“That depends a good deal on where you  
want to get to,” said the Cat.

“I don't much care where,” said Alice.

“Then it doesn't matter which way you  
go,” said the Cat.

--Lewis Carroll

in *Alice's Adventures in Wonderland*

# Goal: Transition to reliable and secure renewable energy while aggressively reducing overall demand.

- **Objective 1:** Eliminate energy inefficiencies that waste natural and financial resources in existing facilities using FY2003 as a baseline (kwh/sqft).
- ***“How you use it”***
- **Objective 2:** Increase energy efficiency in renovation and new construction.
- ***“How you construct it”***
- **Objective 3:** Reduce dependency on fossil fuel and increase the use of clean renewable energy.
- ***“What the source is”***
- **Objective 4:** Improve surety and reliability of energy systems to provide dependable utility services.
- ***“How you protect it”***

# “Golden” Home of Fort Bragg’s Elite Parachute Team



*The Right Way...The Green Way...All the Way!*

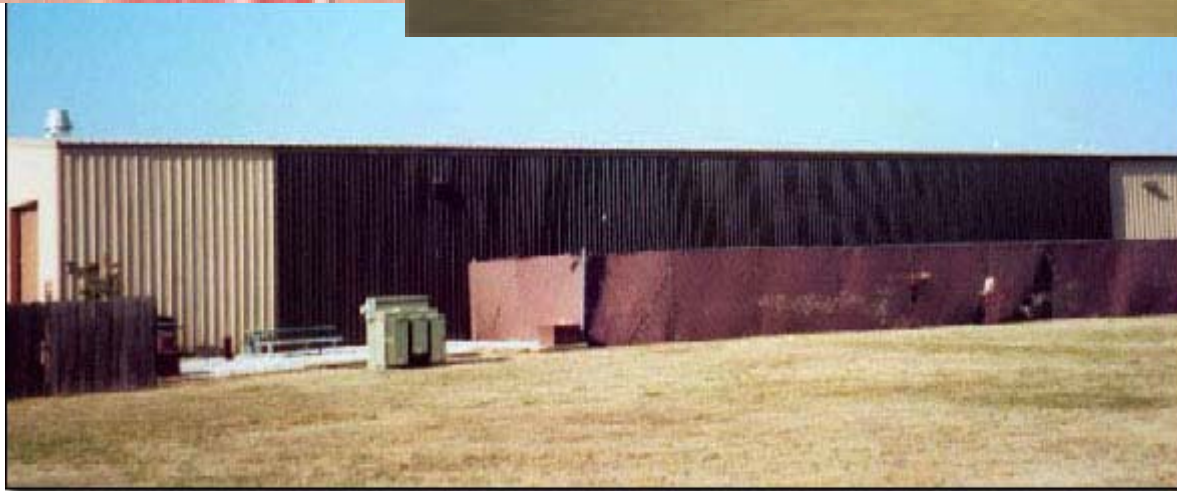


*The Right Way...The Green Way...All the Way!*

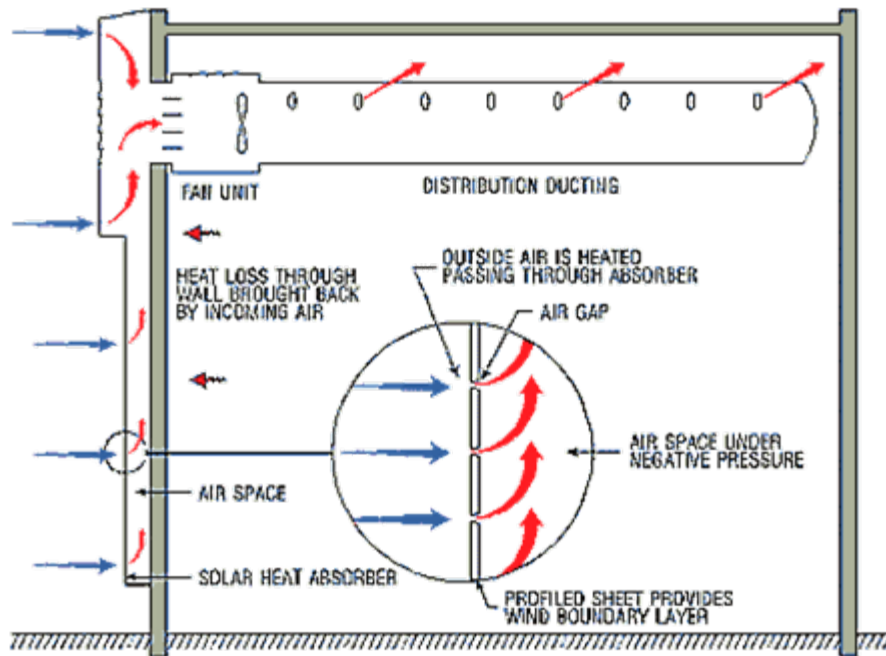


# SOLARWALL®

Fresh Air Heating System







## **SOLARWALL® Performance and Economics**

Operating Efficiency: up to 75%

Estimated RSI value: 9 (R-value: 50)

Annual Energy Savings: \$1- \$6/ft<sup>2</sup> (\$10 - \$60/m<sup>2</sup>)

Estimated Payback Period:

New: 0 - 3 Years

Retrofit: 3 - 8 Years

# Active Daylighting Systems

